Texas, and Chico, California. At each of these places between 600 and 1500 varieties of *Opuntia* were under cultivation. The general purpose of the investigations was economic, but incidentally the behavior of these plants was very suggestive. Spiny plants grown near the coast of Texas mature spines much more slowly than in drier regions. Changes in the environment seem to have more effect on the production of spicules (bristles) than of spines, the evidence indicating that conditions unfavorable to vegetative production stimulate the growth of spicules. An interesting contrast between the conditions in Southern Texas and California is shown by the fact that the former region is favorable for the production of vegetative growth, while California is better adapted to fruit production. It was found that many species are not promising for breeding purposes because of lack of variability; they are very constantly spiny, and spine protection seems to be directly proportional to plant vigor. The power of recovery from the effect of low temperature is remarkable, especially when the succulency of the plant is considered. A very interesting observation was that in many of the species, especially the larger ones, the plants grown from cuttings and those grown from seeds are very different in appearance; the latter are tree-like and the former are headed on the ground without distinct stems.—J. M. C.

Mitosis in Conjugatae.—In agreement with the earlier work of LUTMAN, VAN WISSELINGH[22] finds that the nuclei of *Closterium* show at all stages an essential correspondence with those of higher plants. Division is strictly mitotic, and the chromosomes, more than 60 in number and of various lengths, all come directly from the reticulum, which is composed of but one material. They are not placed in a ring around a central spindle at metaphase, as LAUTERBORN thought, but form a uniform plate of the usual type. VAN WISSELINGH denies the presence of a continuous spirem at prophase and telophase as reported by LUTMAN. The nucleolus is not of the peculiar kind previously described for *Spirogyra;* in *C. Ehrenbergii* it is really an agglomeration of many small nucleoli. No centrosomes were found.

In *Eunotia*,[23] also, the nucleus divides mitotically, as in other diatoms, but well developed chromosomes are not formed. The nuclear reticulum gives rise to small irregular bodies which become arranged in the form of a "nuclear plate" around the characteristic "central spindle" of the diatoms. The nuclear plate divides to form two daughter plates. VAN WISSELINGH'S results here agree with those of KLEBAHN and KARSTEN on other diatoms, but not with those of LAUTERBORN, who found in several species long and well developed chromosomes in both mother and daughter nuclei.

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[22] VAN WISSELINGH, C., Über die Kernstruktur und Kernteilung bei *Closterium*. Siebenter Beitrag zur Kenntnis der Karyokinese. Beih. Bot. Centralbl. **29**[1]:409–432. *pl. 10.* 1913.

[23] VAN WISSELINGH, C., Die Kernteilung bei *Eunotia major* Rabenh. Achter Beitrag zur Kenntnis der Karyokinese. Flora **105**:265–274. *pl. 10.* 1913.

The value of these contributions is unfortunately impaired by the small size and diagrammatic character of the illustrations.—L. W. SHARP.

Morphology of Tetraclinis.—SAXTON[24] has investigated *Tetraclinis articulata*, the "gum sandarach" tree of Morocco and Algeria. He has given an unusually detailed account of microsporogenesis. The mature pollen grain is uninucleate, and approximately three months elapse between pollination and fertilization; while it is 12 months from the first appearance of the strobili to the complete maturity of the seeds. The development of both gametophytes resembles that of other *Cupressus* forms. Wall-formation in the proembryo occurs in passing from the four-nucleate to the eight-nucleate stage, the mature embryo being somewhat variable in the number and arrangement of the cells. More than one tier of cells takes part in suspensor formation. In the mature embryos three, four, and five cotyledons were found. One of the interesting cytological features is the segregation of the chromosomes into two groups in the prophase of the first division of the fertilized egg. This is taken to be an evidence of the continued individuality of male and female chromosomes. The chromosome numbers were found to be 12 and 24. SAXTON is inclined to believe that the *Callitris* group was derived from the *Cupressus* group through some plant resembling *Tetraclinis*. He traces a geographic line of evolution from northern to southern Africa, and thence by means of former antarctic land connection to Australia. This would make *Widdringtonia* the most primitive of the *Callitris* forms.—J. M. C.

The absorption of water by aerial organs.—It is now pretty generally believed that the absorption of water by the aerial organs of vascular plants is rarely a thing of consequence outside of the Bromeliaceae, although it has been known for a long time that flaccid leaves immersed in water recover their turgescence. Experiments made by various investigators have shown that the cell sap of *Salicornia* and other salt marsh plants has an osmotic pressure considerably above that of sea water. Hence the question arose with Miss HALKET as to the possibility of such plants absorbing water when immersed at high tide. It was found that the aerial organs of *Salicornia* plants can absorb water from a 3 per cent solution of sodium chloride, and a larger amount from distilled water.[25] As might be expected, the amount absorbed is greatly increased if the plants are allowed to transpire freely before immersion, without being able to absorb water through the roots. Experiments made on non-halophytic plants under similar conditions resulted in a loss of water rather than in absorption, hence it is concluded that the absorption noted in the salt marsh plants

[24] SAXTON, W. T., Contributions to the life-history of *Tetraclinis articulata* Masters, with some notes on the phylogeny of the Cupressoïdeae and Calltroïdeae. Ann. Botany **27**:577–605. *figs. 9. pls. 44–46.* 1913.

[25] HALKET, ANN C., Some experiments on absorption by the aerial parts of certain salt-marsh plants. New Phytol. **10**:121–139. 1911.